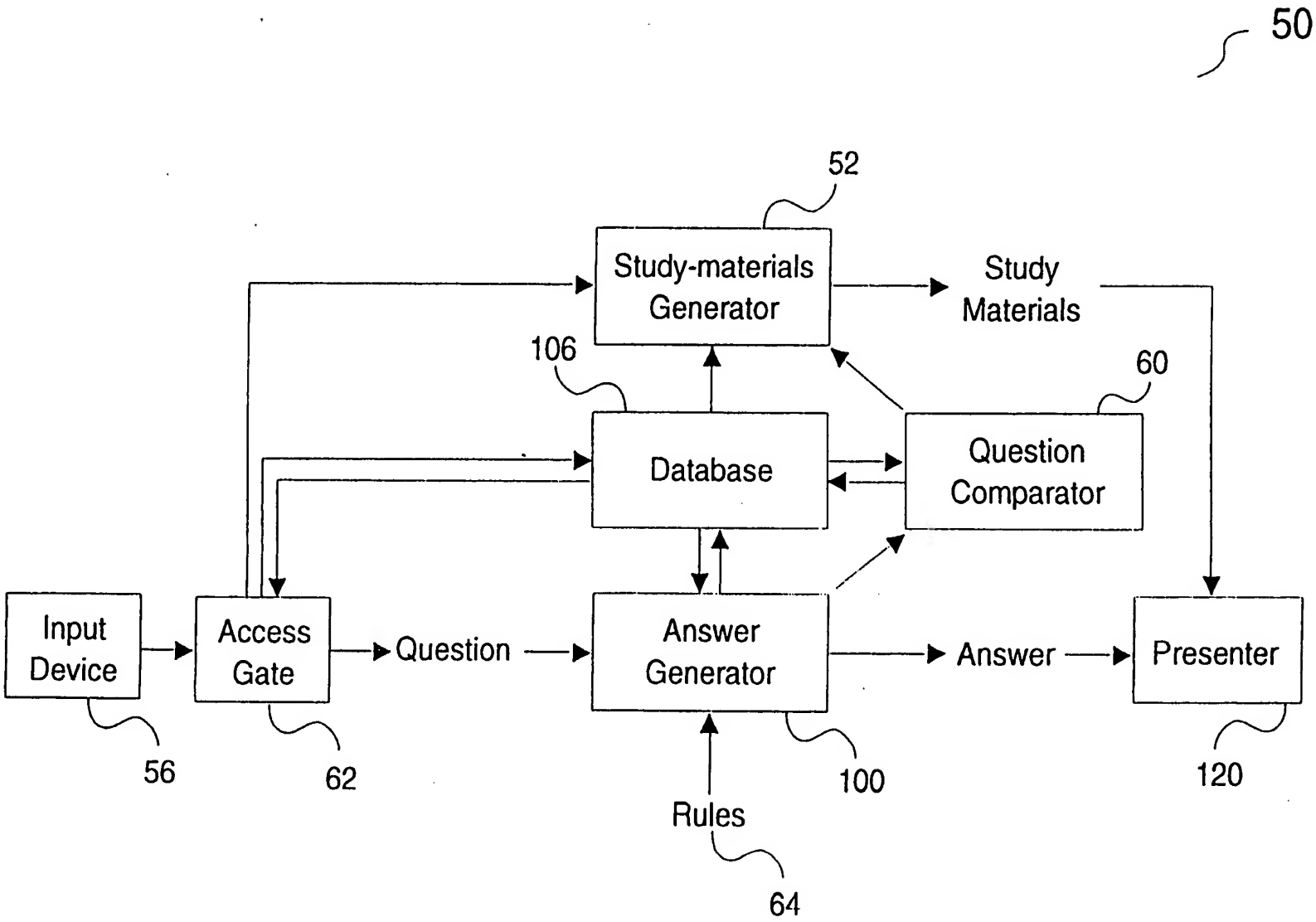
50
52
Study-materials Generator
Study Materials
106
60
Database
Question Comparator
Input Device
Access Gate
Question
Answer Generator
Answer
Presenter
56
62
100
120
Rules
64

Figure 1

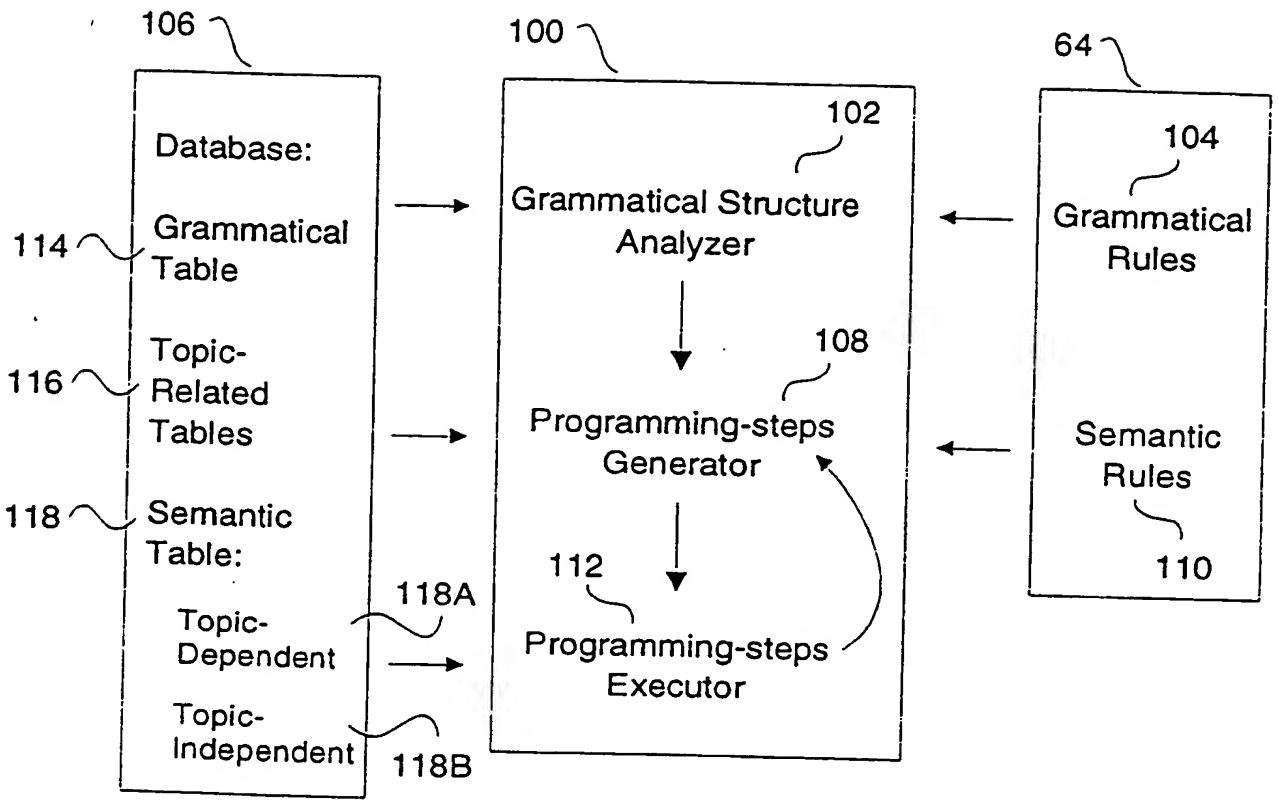
106
Database:
114
Grammatical Table
116
Topic-Related Tables
118
Semantic Table:
118A
Topic-Dependent
Topic-Independent
118B
100
102
Grammatical Structure Analyzer
108
Programming-steps Generator
112
Programming-steps Executor
64
104
Grammatical Rules
Semantic Rules
110

Figure 2

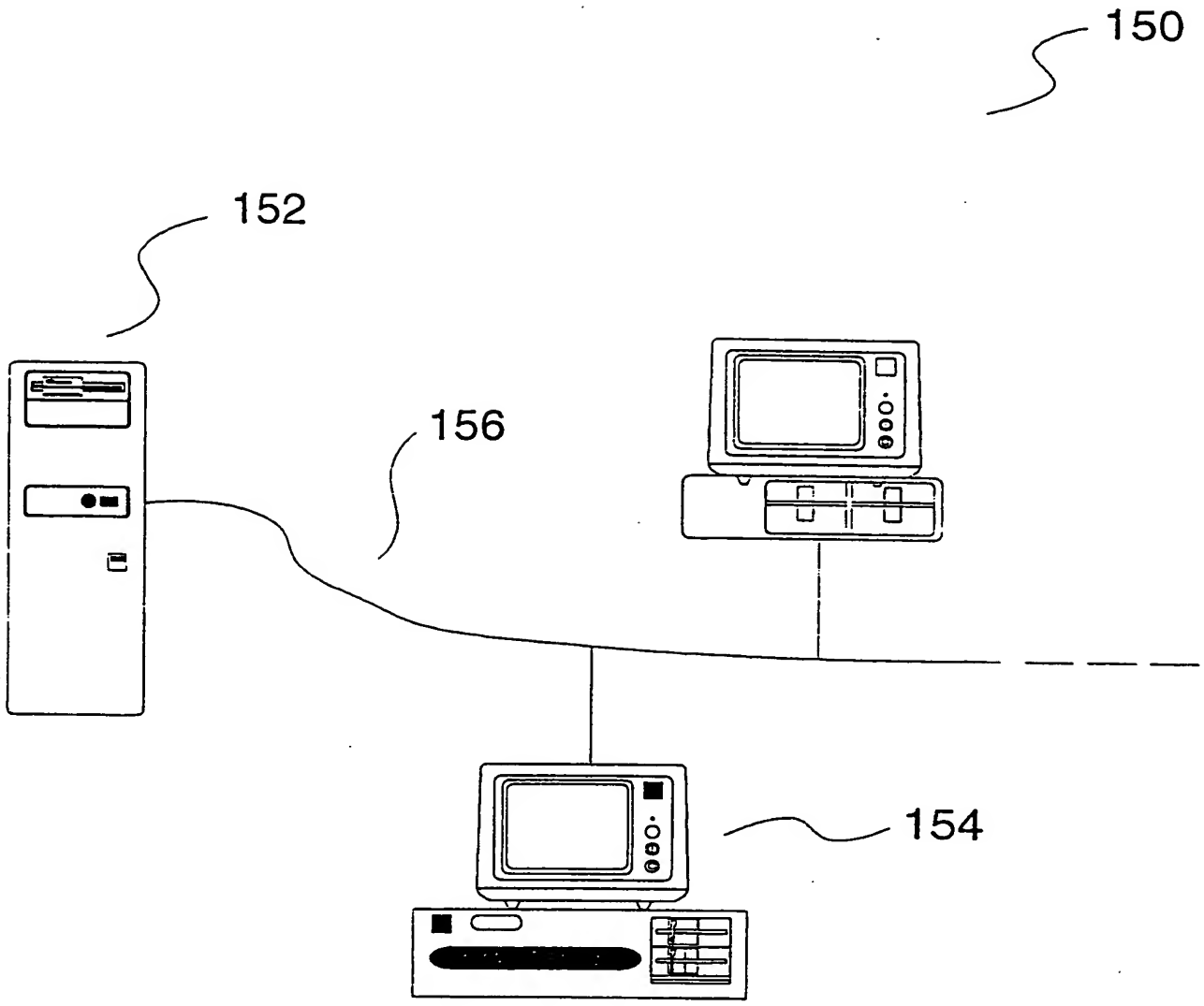

Figure 3A

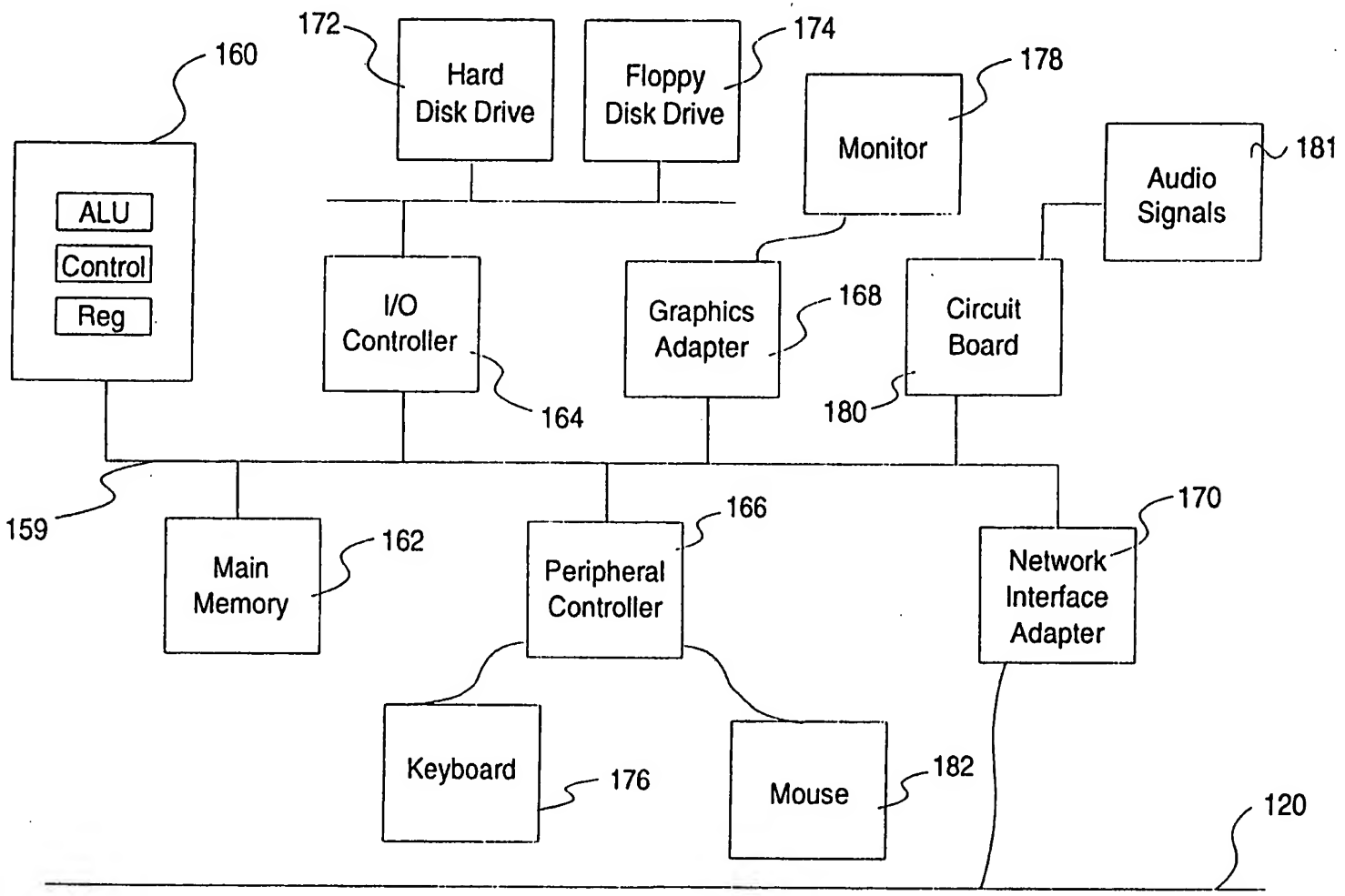
172
Hard Disk Drive
174
Floppy Disk Drive
178
Monitor
181
Audio Signals
160
ALU
Control
Reg
I/O Controller
164
Graphics Adapter
168
Circuit Board
180
159
Main Memory
162
166
Peripheral Controller
170
Network Interface Adapter
Keyboard
176
Mouse
182
120

Figure 3B

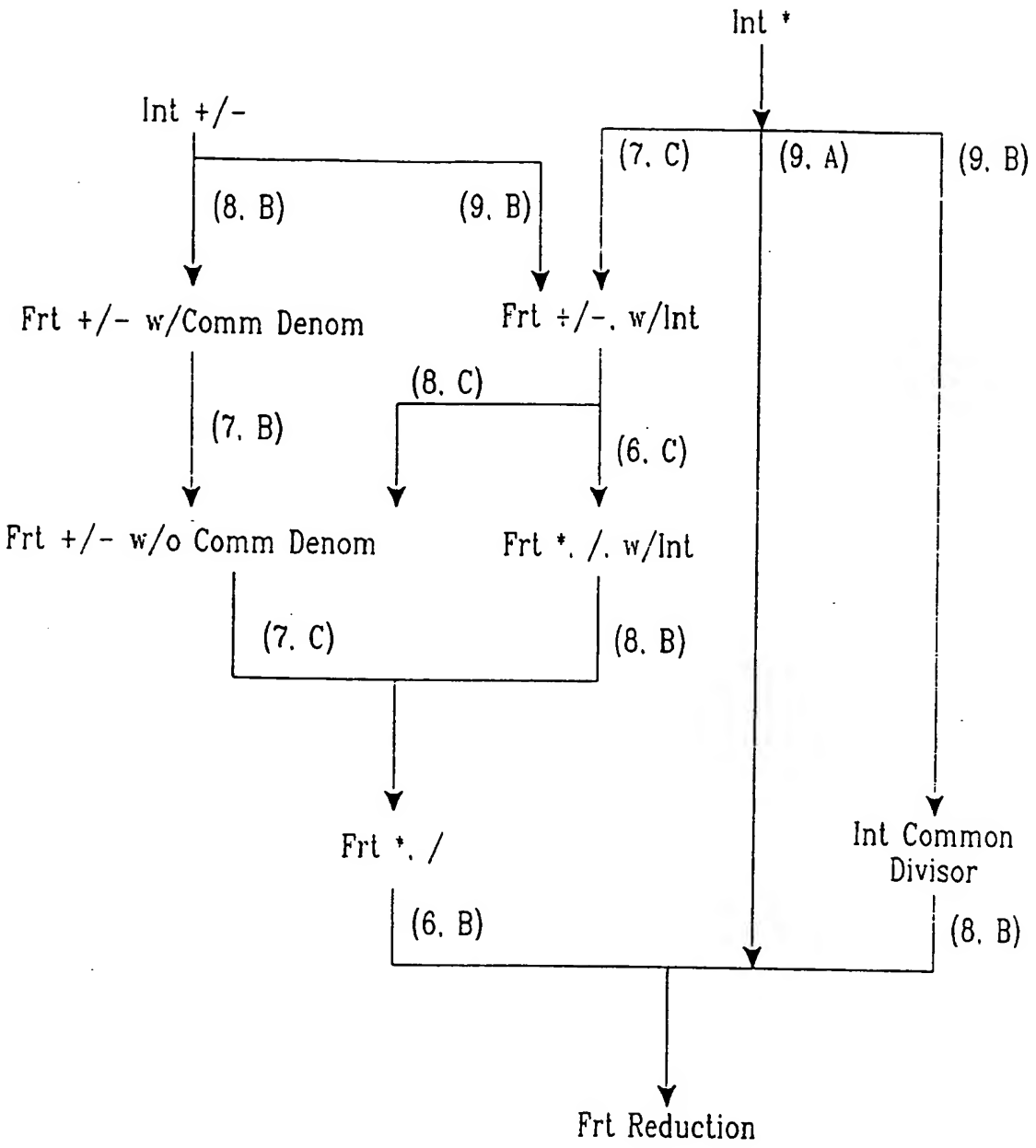
Int *
Int +/-
(7. C)
(9. A)
(9. B)
(8. B)
(9. B)
Frt +/- w/Comm Denom
Frt ÷/-. w/Int
(8. C)
(7. B)
(6. C)
Frt +/- w/o Comm Denom
Frt *. /. w/Int
(7. C)
(8. B)
Frt *. /
Int Common Divisor
(6. B)
(8. B)
Frt Reduction

Figure 4

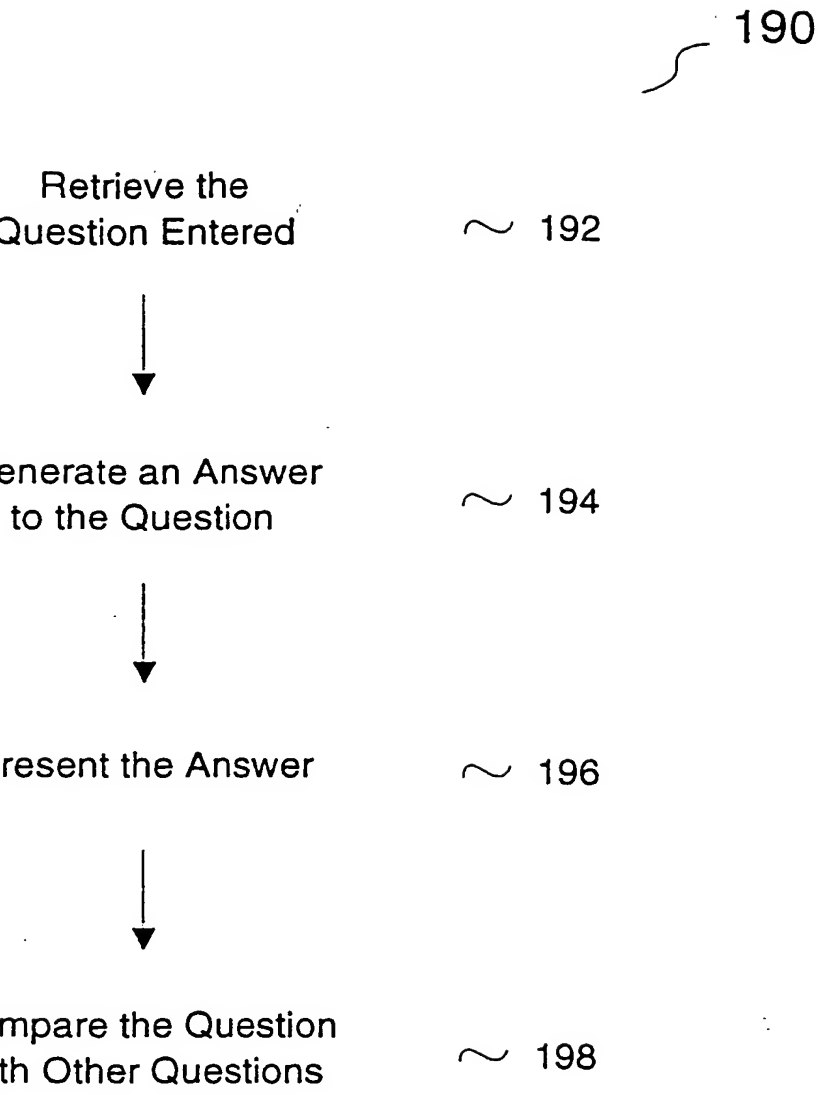
190
Retrieve the Question Entered
192
Generate an Answer to the Question
194
Present the Answer
196
Compare the Question with Other Questions
198

Figure 5

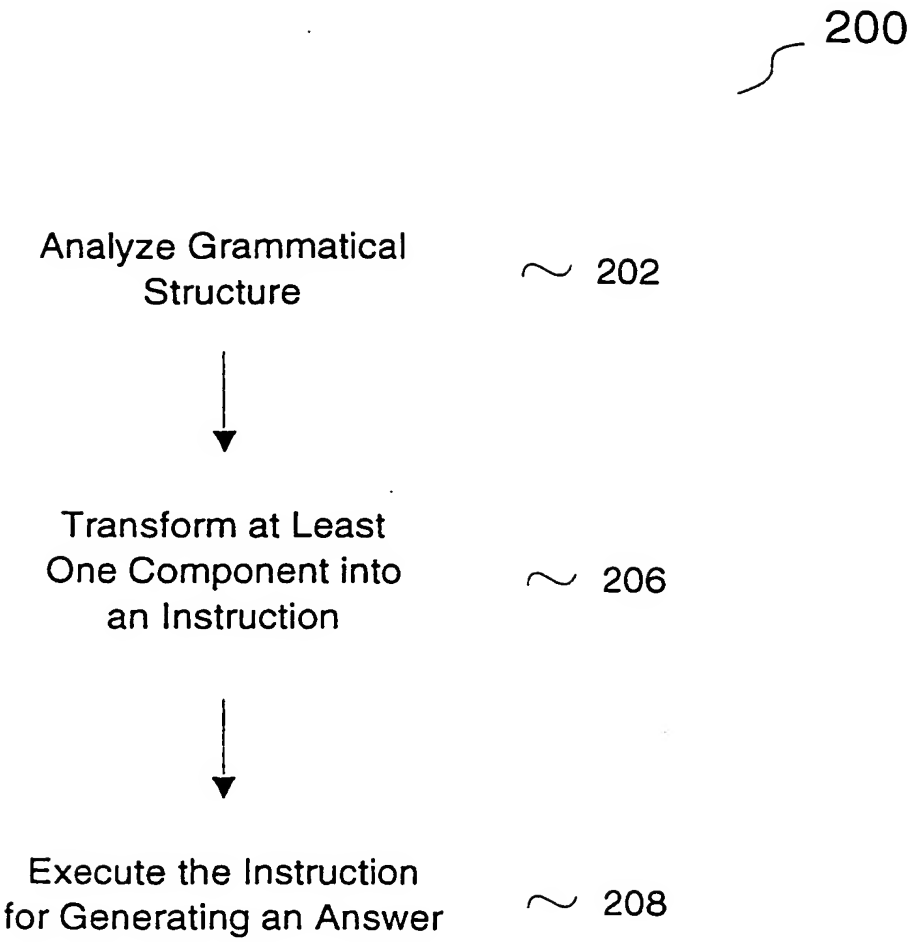
200
Analyze Grammatical Structure
202
Transform at Least One Component into an Instruction
206
Execute the Instruction for Generating an Answer
208

Figure 6

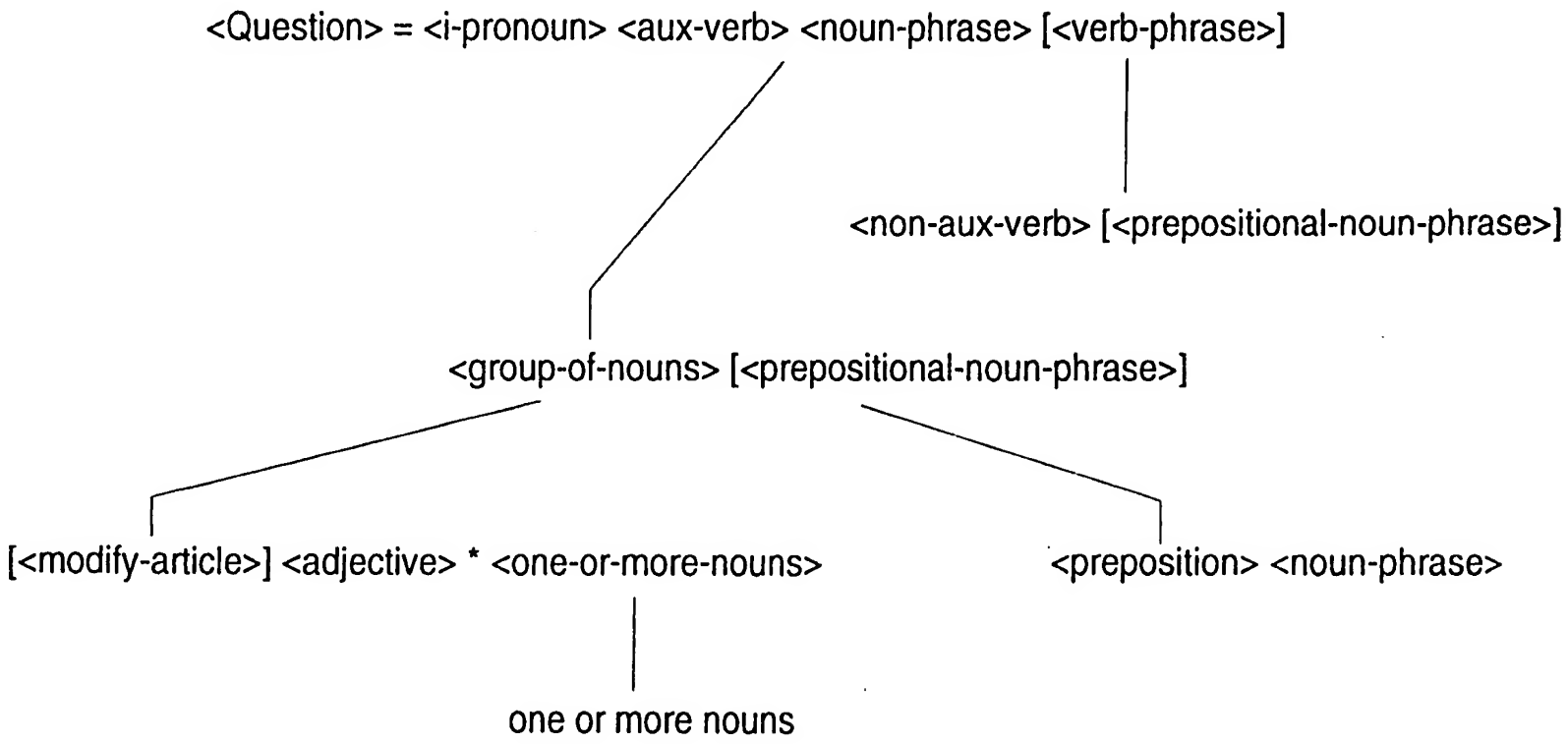
<Question> = <i-pronoun> <aux-verb> <noun-phrase> [<verb-phrase>]
<non-aux-verb> [<prepositional-noun-phrase>]
<group-of-nouns> [<prepositional-noun-phrase>]
[<modify-article>] <adjective> * <one-or-more-nouns>
<preposition> <noun-phrase>
one or more nouns

Figure 7

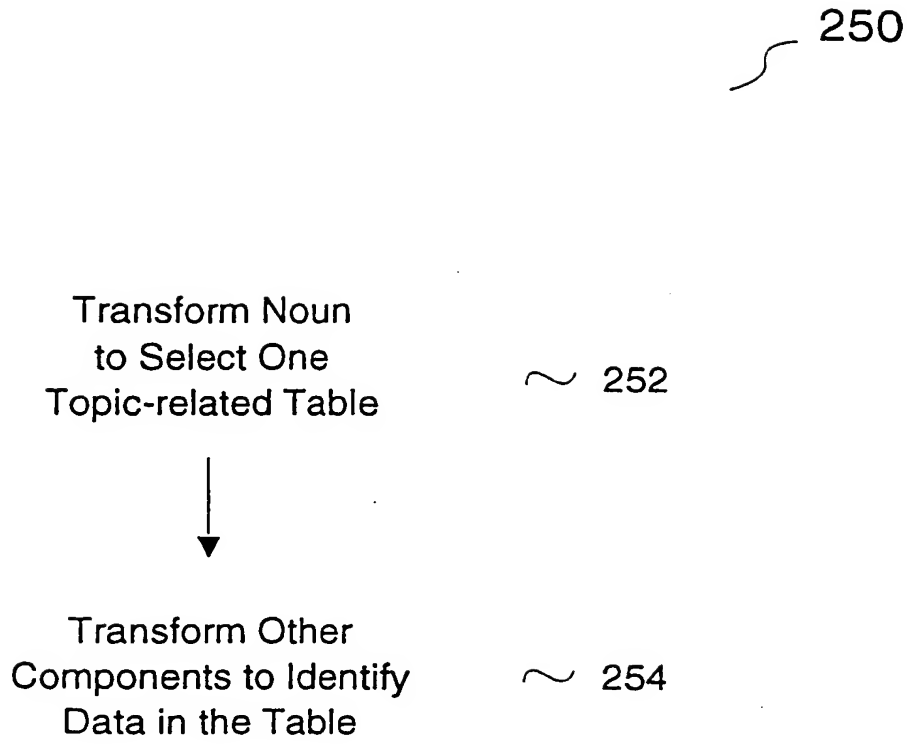
250
Transform Noun to Select One Topic-related Table
252
Transform Other Components to Identify Data in the Table
254

Figure 8A

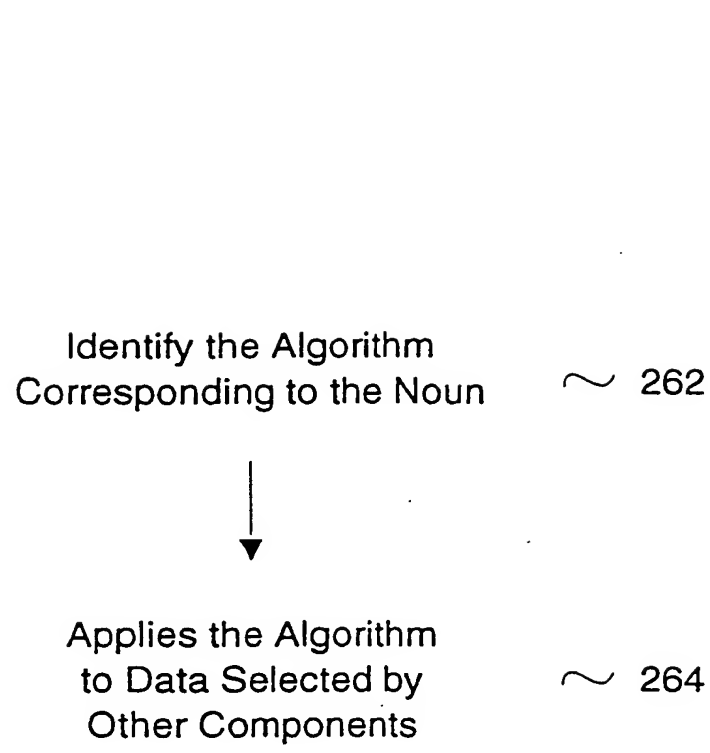
260
Identify the Algorithm Corresponding to the Noun
262
Applies the Algorithm to Data Selected by Other Components
264

Figure 8B

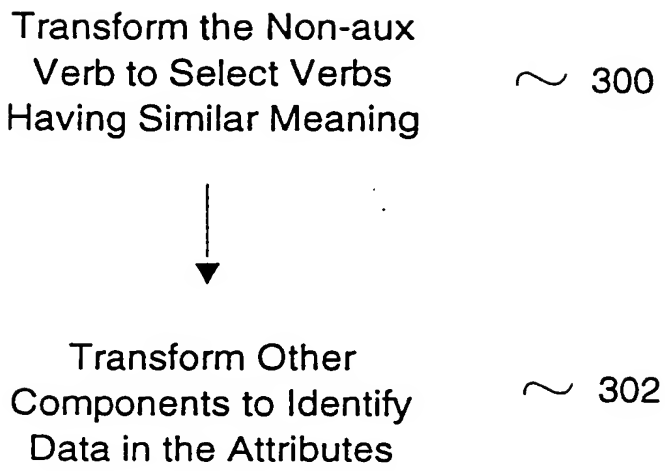
Transform the Non-aux Verb to Select Verbs Having Similar Meaning
300
Transform Other Components to Identify Data in the Attributes
302

Figure 9

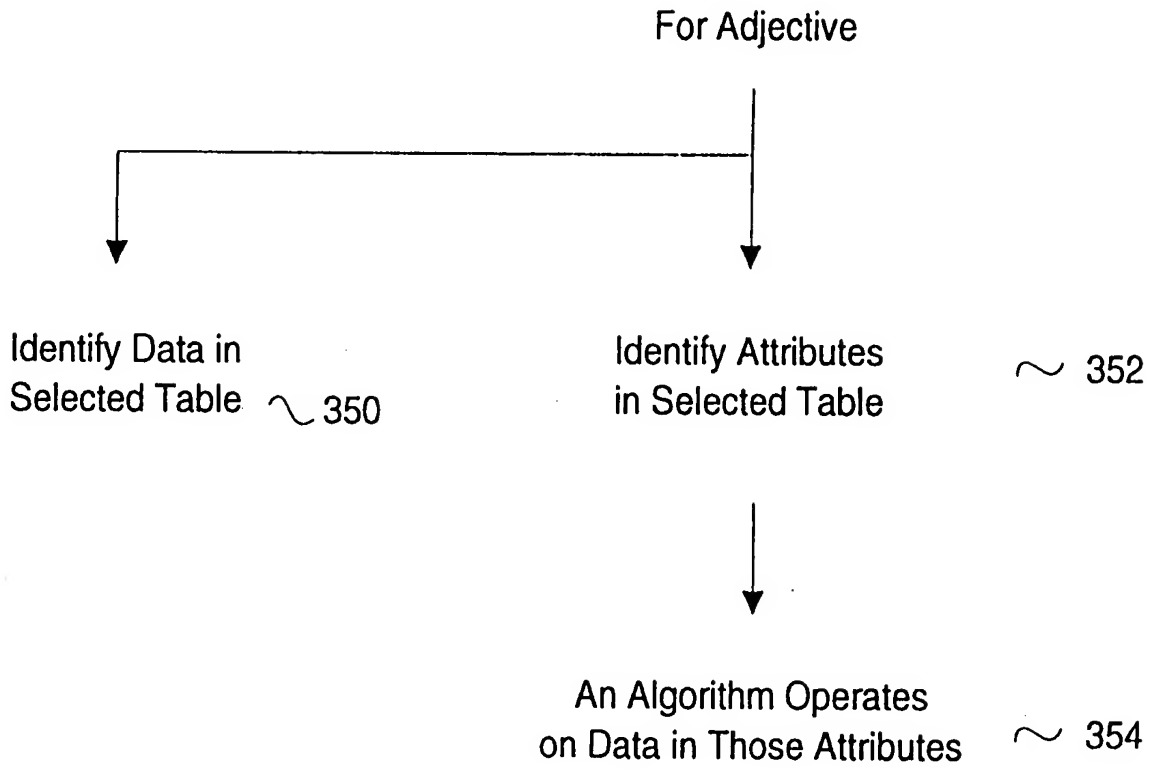
For Adjective
Identify Data in Selected Table
350
Identify Attributes in Selected Table
352
An Algorithm Operates on Data in Those Attributes
354

Figure 10

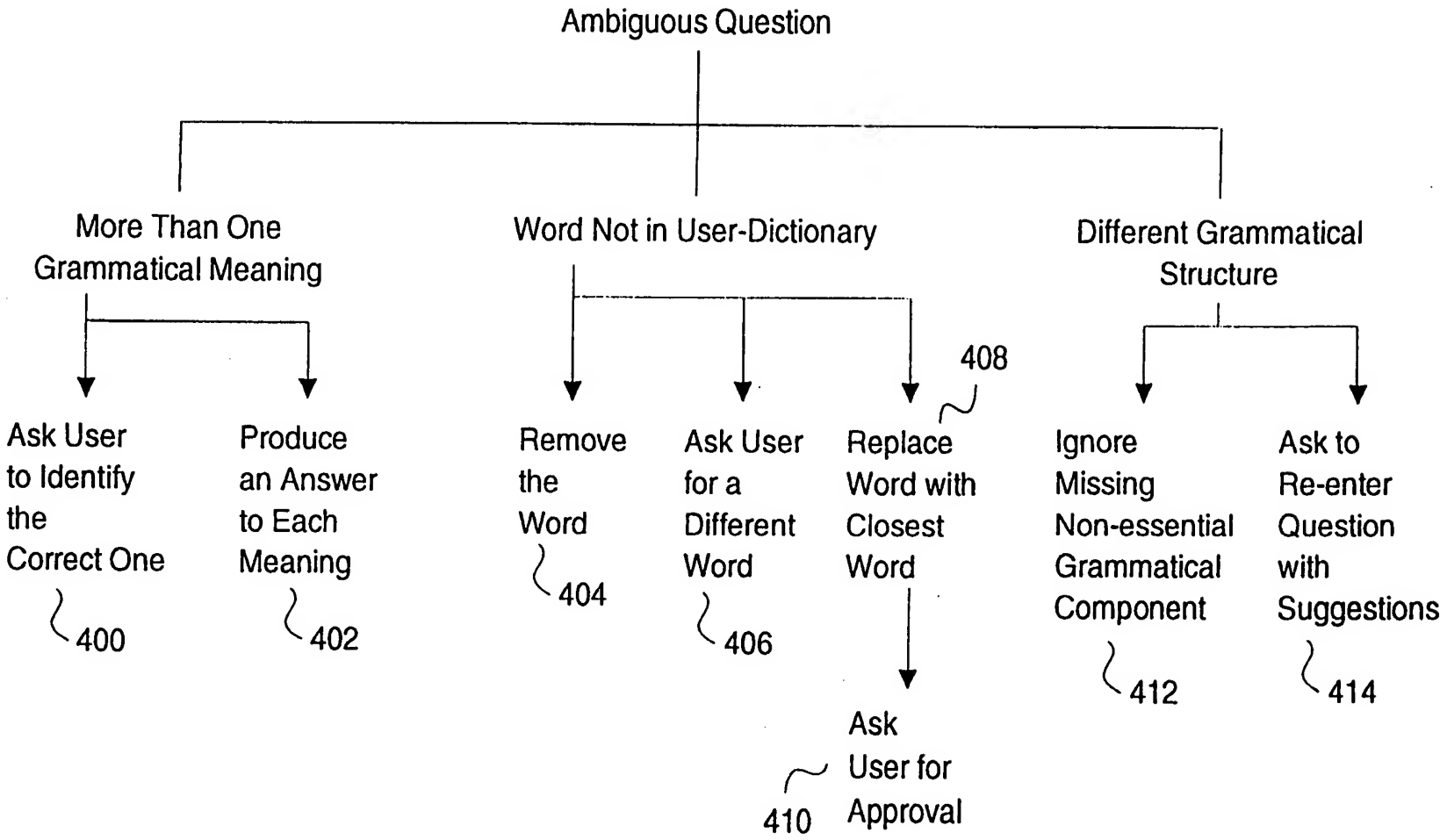
Ambiguous Question
More Than One Grammatical Meaning
Word Not in User-Dictionary
Different Grammatical Structure
Ask User to Identify the Correct One
400
Produce an Answer to Each Meaning
402
Remove the Word
404
Ask User for a Different Word
406
Replace Word with Closest Word
408
Ask User for Approval
410
Ignore Missing Non-essential Grammatical Component
412
Ask to Re-enter Question with Suggestions
414

Figure 11

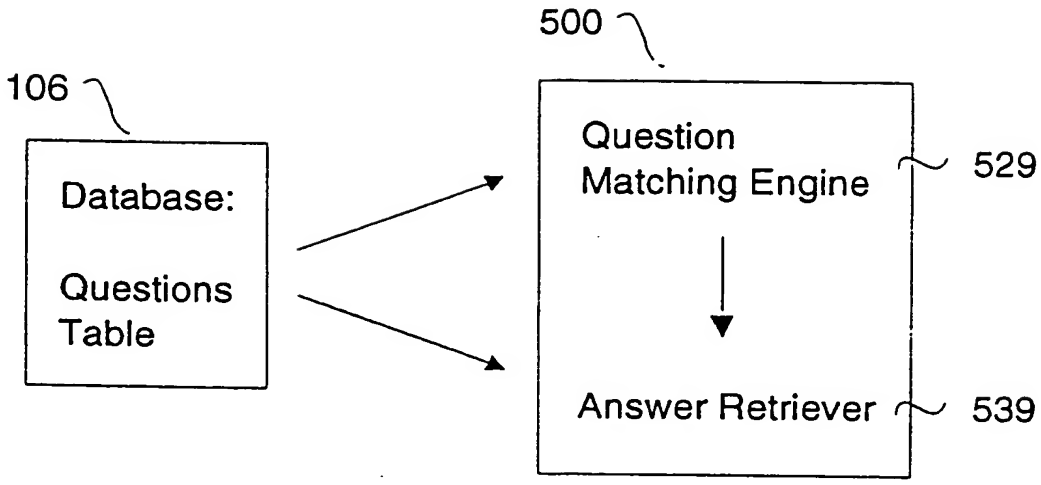
500
106
Database:
Questions
Table
Question
Matching Engine
529
Answer Retriever
539

Figure 12

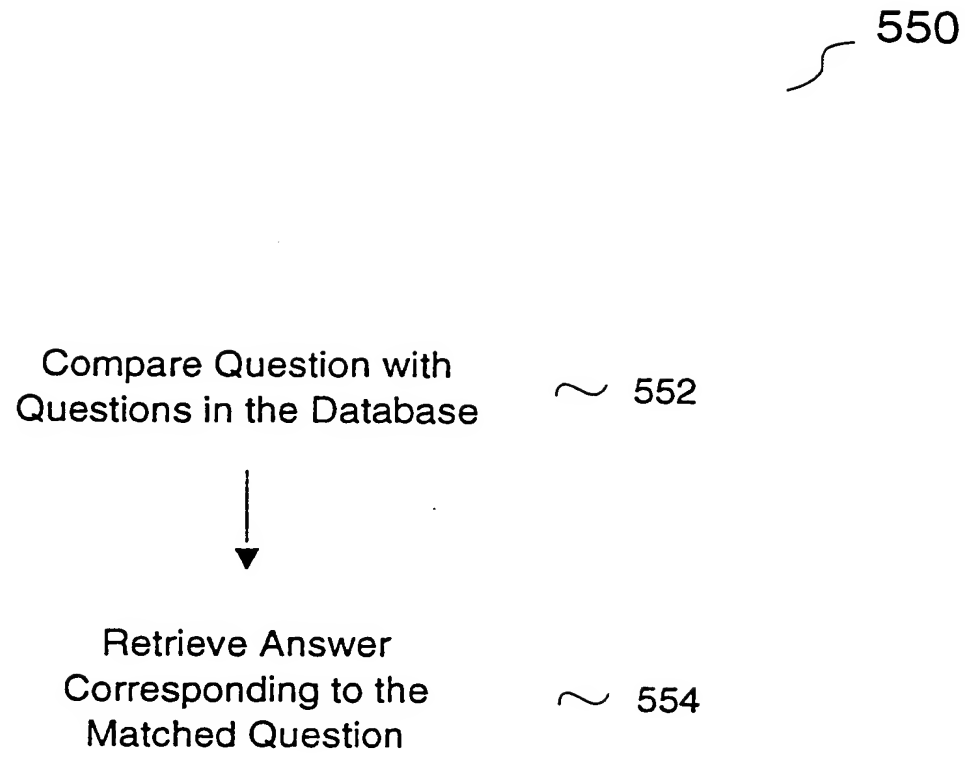
550
Compare Question with Questions in the Database
552
Retrieve Answer Corresponding to the Matched Question
554

Figure 13

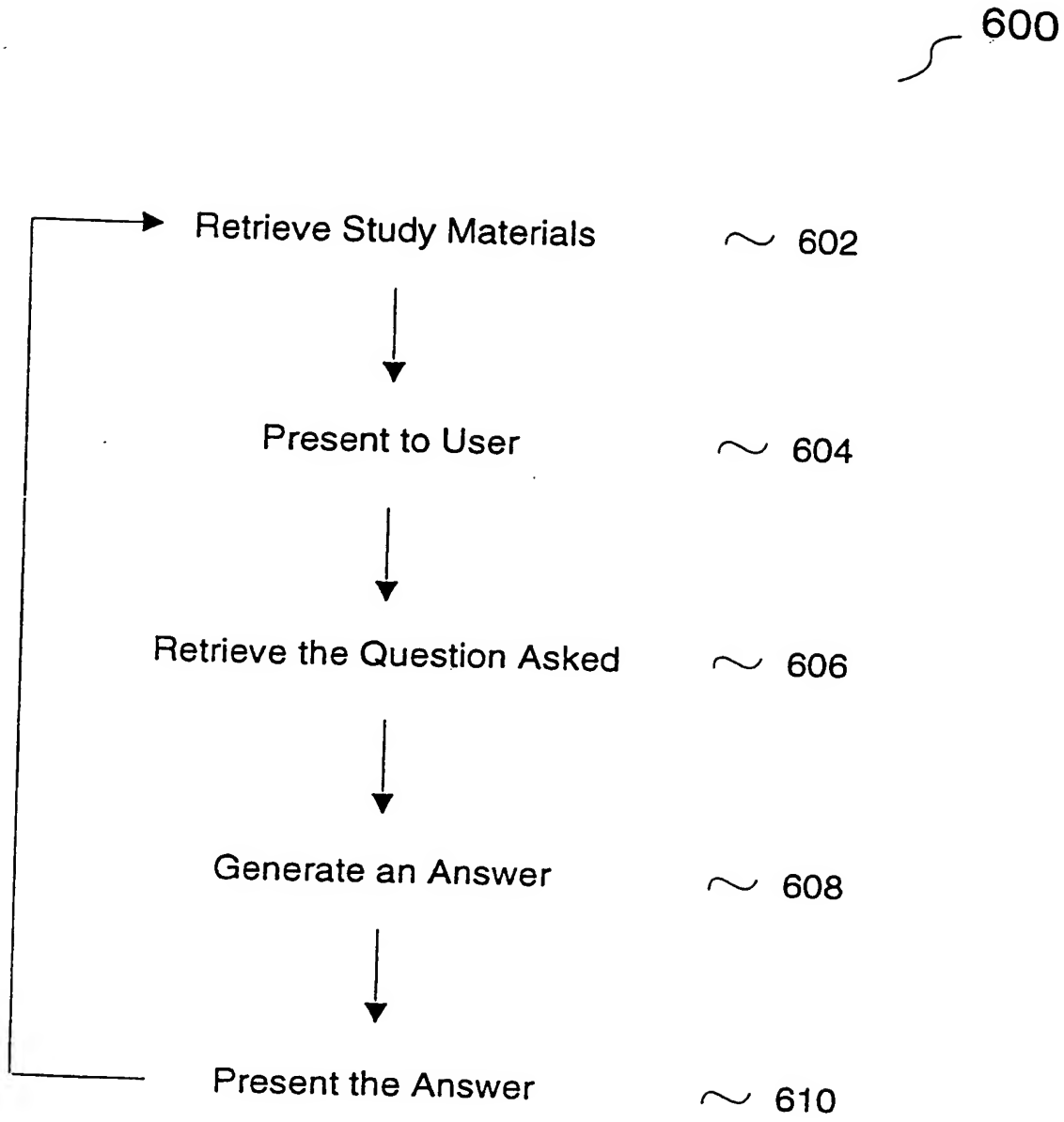
600
Retrieve Study Materials
602
Present to User
604
Retrieve the Question Asked
606
Generate an Answer
608
Present the Answer
610

Figure 14